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Ecological risk assessment of the sediments by the triad approach

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Abstract

© SGEM2014 All Rights Reserved. The quality of sediment was assessed at 33 sites in the Kuibishev water reservoir with the sediment quality TRIAD method. The TRIAD approach was used to assess relationships between effects on the benthos community structure, sediment toxicity and sediment contamination. The results of chemical analyses were evaluated using regional criteria for sediment quality. At most of 33 sites studied, the macrofauna community was poorly developed and indicated low abundances of benthic species and a high dominance of tolerant taxa. Acute toxicity test were conducted using the algae Pseudokirchneriella subcapitata, the crustacea Thamnocephalus platyurus, the rotifer Brachionus calyciflorus, the protozoa Tetrachymena thermophila, and chronic contact tests were conducted with Daphnia magna. The results of bioassays indicated that sediment samples for 17 sites were acute toxic, while chronic toxicity was observed at 28 sites. Using the sediment quality TRIAD approach, accordance between sediment chemistry, sediment toxicity, and degraded benthic communities was observed. Chemical contamination was considered to be the participial factor causing the effects that were observed in the field.

Keywords

Bioassays, Macrozoobenthos, Sediment, Triad approach